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| 10/562,554 | 12/28/2005 | Hidekazu Mori | 4670-0114PUS1 | 8229 |

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| EXAMINER | |
|---|---|
| PARENDO, KEVIN A | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2823 | |

| NOTIFICATION DATE | DELIVERY MODE |
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| 11/12/2008 | ELECTRONIC |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/562,554 | MORI ET AL. | |
| | Examiner | Art Unit | |
| | Kevin A. Parendo | 2823 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 December 2005* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/28/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

**DETAILED ACTION**

Application Number: 10/562554

***Drawings***

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the claimed material of claims 1-12 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Specification***

2. The abstract of the disclosure is objected to because it contains the phrase "comprises." The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The phrase should be changed to "includes." Correction is required. See MPEP § 608.01(b).

***Claim Objections***

3. Claim 1 is objected to because it contains the limitation "the resultant powdery mixture" on line 5. This limitation has not been claimed previously to this instance and thus lacks proper antecedent basis. To avoid any ambiguity, the word "resultant" in this limitation should be deleted.

4. Claim 5 is objected to because it contains the limitation "the surface" on line 3. This limitation has not been claimed previously to this instance and thus lacks proper antecedent basis. To avoid any ambiguity, the word "the" in this limitation should be change to "a". Furthermore, the word "further" should be amended before the word "comprises" on line 1.

5. Claim 7 is objected to because it contains the limitation "the particle diameter" on line 1. This limitation has not been claimed previously to this instance and thus lacks

proper antecedent basis. To avoid any ambiguity, the word "the" in this limitation should be change to "a".

6. Claim 7 is objected to because it contains the limitation "is from" on line 2 that would be clearer if it were amended to "is in the range of".

7. Claim 11 is objected to because it contains the limitation "an electrode" and "an electric double layer capacitor," which have both been claimed already in claim 1; these should be amended to "the electrode" and "the electric double layer capacitor". Furthermore, the word "claims" on line 2 of claim 11 should be amended to "claimed".

8. Claim 12 is objected to because it contains the limitation "an electrode" and "an electric double layer capacitor," which have both been claimed already in claim 11; these should be amended to "the electrode" and "the electric double layer capacitor".

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1, 4, and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Matsubara et al. (US 7,326,497 B2, hereinafter "Matsubara").

Re claim 1, Matsubara discloses a method for producing an electrode for an electric double layer capacitor (column 3, lines 35-36), comprising:

- a step of mixing a particulate elastomer ("binder", column 8, line 1, which is an elastomer "styrenebutadiene rubber", column 8, lines 19-20) and a carbonaceous material (graphite, column 8, line 1) with each other in a powdery form ("graphite powder," column 8, line 5; the binder may form a dispersion, which is a process wherein particles separate uniformly throughout a liquid, see column 8, line 14), thereby obtaining a powdery mixture (the "powdery mixture" may contain a solvent, as long as it is later evaporated, see applicant's specification, pages 10-11); and
- a step of dry-forming the resultant powdery mixture (after the paste 1 is applied to the copper film collector 1, Fig. 1, a heater 5 removes the solvent and a press roller is used to dry-form the mixture, Fig. 3), thereby forming an electrode layer.

Re claim 4, Matsubara further discloses that the carbonaceous material further comprises an electroconductivity additive ("carbon black," column 6, lines 42-43).

Re claim 8, Matsubara further discloses that the dry-forming is press-molding ("pressed with a press roller," column 9, line 6).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 1, 3-8, and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al. (US 4,717,595, hereinafter "Watanabe") in view of Sonobe et al. (US 6,258,337 B1, hereinafter "Sonobe").

Re claim 1, Watanabe discloses a method for producing an electrode for an electric double layer capacitor (column 1, lines 15-16), comprising:

- a step of mixing a particulate elastomer ("latex" styrene-butadiene rubber, column 2, lines 15-17 and 38-42) and a carbonaceous material (column 2, lines 5 and 43-47) with each other in a powdery form (column 2, lines 4-9 and 45-54), thereby obtaining a powdery mixture; and
- a step of dry-forming (column 2, lines 8-9 and 55-60, wherein the excess solvent is removed, which is considered dry-forming by the applicant, see applicant's specification, pages 10-11) the resultant powdery mixture.

Re claim 1, Watanabe, though having discussed the general purposes of using carbonaceous materials as electrodes in electric double layer capacitors (column 1, lines 15-16), fails to specifically disclose that the steps listed above are used to form an electrode. Sonobe discloses combining a particular binder and a carbonaceous material to create a powdery mixture, dry-forming (by compression molding) that

mixture, thereby forming an electrode of an electric double layer capacitor (column 7, line 66-column 8, line 29). It would have been obvious to one of ordinary skill in the art at the time the invention was made to add formation of an electrode of Sonobe to the invention of Watanabe. The motivation to do so is that the combination produces the predictable results of using the method of Watanabe to form a laminate of electrodes and electrolytic solution (column 8, lines 10-15) in order to completely form an electric double layer capacitor.

Re claim 3, Watanabe further discloses that the carbonaceous material comprises activated carbon (column 2, lines 66-68) as an active material.

Re claim 4, Watanabe and Sonobe disclose the limitations of claim 1, as discussed above, and Watanabe discloses that the carbonaceous material may be any of active carbon, graphite, acetylene black, and furnace black, but does not disclose that they may be combined. Thus, Watanabe does not disclose that the carbonaceous material further comprises an electroconductivity additive (acetylene black or furnace black). Sonobe discloses that the carbonaceous material further comprises an electroconductivity additive (carbon black, column 5, line 14). It would have been obvious to one of ordinary skill in the art at the time the invention was made to add electroconductivity additive of Sonobe to the invention of Watanabe. The motivation to do so is that the combination produces the predictable results of increasing the conductivity (column 5, line 14) of the mixture.

Re claim 5, Watanabe and Sonobe disclose the limitations of claim 1, as discussed above, and Watanabe fails to further disclose a step of causing the

electroconductivity additive to adhere onto the surface of the active material by mechanochemical treatment. Sonobe discloses a step of causing the electroconductivity additive to adhere onto the surface of the active material by mechanochemical treatment (kneading, column 7, line 67; this mechanical external force is a compressive or shearing force, as described in the applicant's specification on page 9). It would have been obvious to one of ordinary skill in the art at the time the invention was made to add the kneading of Sonobe to the invention of Watanabe. The motivation to do so is that the combination produces the predictable results of adding an electroconductivity increasing additive, and mixing it, thus increasing the conductivity (column 5, line 14) of the mixture.

Re claim 6, Watanabe and Sonobe disclose the limitations of claim 1, as discussed above, but Watanabe fails to further disclose that the powdery mixture is a mixture obtained by fluidized bed granulation or fluidized bed multifunction mode granulation. Sonobe discloses that the powdery mixture is a mixture obtained by fluidized bed granulation or fluidized bed multifunction mode granulation (column 7, line 22-30). It would have been obvious to one of ordinary skill in the art at the time the invention was made to add the fluidized bed granulation of Sonobe to the invention of Watanabe. The motivation to do so is that the combination produces the predictable results of pulverizing the carbonaceous material to particles of about 30 um (column 7, line 29).

Re claim 7, Watanabe further discloses that the particle diameter of the powdery mixture is from 0.1 to 1000 um (column 2, lines 34-35).

Re claim 8, Watanabe further discloses that the dry-forming is press-molding (column 2, lines 61-62).

Re claim 10, Watanabe further discloses that the powdery mixture comprises, in 100 parts by weight thereof, 0.1 to 50 parts by weight of the particulate elastomer (25-40, column 3, line 8) and 50 to 99.9 parts by weight of the carbonaceous material (60-75, column 3, line 7).

Re claims 11 and 12, Re claim 1, Watanabe, though having discussed the general purposes of using carbonaceous materials as electrodes in electric double layer capacitors (column 1, lines 15-16), fails to specifically disclose an electric double layer capacitor obtained by the method discussed in claim 1 (as pertains to claim 11), or an electric double layer capacitor comprising an electrode as claimed in claim 11 (as pertains to claim 12).

Sonobe discloses combining a particular binder and a carbonaceous material to create a powdery mixture, dry-forming (by compression molding) that mixture, thereby forming an electrode of an electric double layer capacitor (column 7, line 66-column 8, line 29). It would have been obvious to one of ordinary skill in the art at the time the invention was made to add formation of an electrode of Sonobe to the invention of Watanabe. The motivation to do so is that the combination produces the predictable results of using the method of Watanabe to form a laminate of electrodes and electrolytic solution (column 8, lines 10-15) in order to completely form an electric double layer capacitor.

11. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe and Sonobe as applied to claim 1 above, and further in view of Tsukakoshi et al. (US 6,294,257 B1, hereinafter "Tsukakoshi").

Re claim 2, Watanabe and Sonobe disclose the limitations of claim 1, as discussed above, but fail to further disclose that the particulate elastomer is an elastomer having a crosslinked structure. Tsukakoshi discloses that the elastomer (which preferably comprises styrene-butadiene, column 6, lines 33-43) is preferably cross-linked (column 7, lines 48-50). It would have been obvious to one of ordinary skill in the art at the time the invention was made to add the cross-linking of Tsukakoshi to the inventions of Watanabe and Sonobe. The motivation to do so is that the combination produces the predictable results of forming a stronger elastomer (column 7, lines 48-50).

12. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe and Sonobe as applied to claim 8 above, and further in view of Moriguchi et al. (US 2001/0051300 A1, hereinafter "Moriguchi").

Re claim 9, Watanabe and Sonobe disclose the limitations of claim 8, but fail to further disclose that the press-molding is performed inside a mold wherein a current collector is set. Moriguchi discloses that the press-molding is performed inside a mold wherein a current collector is set (paragraphs 110-111). It would have been obvious to one of ordinary skill in the art at the time the invention was made to add the mold containing an electrode of Moriguchi to the inventions of Watanabe and Sonobe. The

motivation to do so is that the combination produces the predictable results of molding the powder to affix it to a metal foil current collector (paragraphs 110-111).

***Conclusion***

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Parendo, whose can be contacted by phone at (571) 270-5030 or directly by fax at (571) 270-6030. The examiner can normally be reached on Mon.-Thurs. and alternate Fridays from 7 a.m. - 4:30 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith, can be reached on (571) 272-1907. The fax number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kevin A. Parendo/
Examiner, Art Unit 2823
11/7/2008

/Hsien-ming Lee/

Primary Examiner, Art Unit 2823